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ONTARIO DEPARTMENT OF EDUCATION



TECHNOLOGICAL AND TRADES TRAINING BRANCH

Advanced Technical Evening Class Program



REQUIREMENTS FOR CERTIFICATES

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A.T.E.C. NO. 1-1965

Second copy with corrections

Advanced Technical Evening Class Program

page proofs not
used this time to
meet deadline -
page proofs would have
picked up the errors.

The Advanced Technical Evening Class program was established in 1952 to give persons employed in industry an opportunity for self-improvement, and to meet the requirements of industry for a supply of qualified technical personnel.

Results in those centres in which the program, frequently called ATEC, has been in operation, indicate that graduates are succeeding in improving their positions and qualifying themselves for further advancement.

In order to make the Advanced Technical Evening Class courses parallel the three-year day school engineering technology diploma courses offered in the Provincial Institutes of Technology, the programs were reorganized during 1963-64 on three levels in place of two in the original program. Each level may be equated to the successful completion of one year of a corresponding day school course by the proper choice of subjects. Now, a secondary school graduate, who enters employment after completing Grade 12, may obtain the equivalent of an institute of technology day school course through attendance in an evening school program. Three grades of certificates are issued by the Department of Education, one for successful completion of each level.

While the Advanced Technical Evening Class program is designed for the student who would be interested normally in qualifying for one or more of the certificates, it is also intended as a means whereby a student may improve his knowledge in specific subjects even though he does not intend to complete the total requirements for a certificate. The intent is to keep this program as flexible as possible to meet the varying needs of students.

These reorganized Advanced Technical Evening Class programs resulted from discussions with representatives of industry, boards of education, the Association of Professional Engineers of the Province of Ontario, the Ontario Association of Certified Engineering Technicians and Technologists, the Ontario Industrial Educational Council, the Chemical Institute of Canada, the Canadian Industrial Management Association, and the principals and faculty members of institutes of technology.

Grade I Certificate Course

(Nine Subjects)

REQUIREMENTS FOR ADMISSION

The minimum entrance requirement is the Ontario Secondary School Graduation Diploma obtained after successful completion of any Grade 12 (Ontario) course, provided the applicant has passed the Mathematics and Science subjects of Grades 11 and 12, or has the equivalent standing from other provinces or countries.

Applicants over 22 years of age may be admitted provided they have passed English, Mathematics and Science subjects of Grades 11 and 12, or, can submit evidence to the satisfaction of the principal that they are potentially capable of benefiting from the instruction.

REQUIREMENTS FOR A CERTIFICATE

A Grade I certificate will be awarded to any student who completes successfully English I, Mathematics I, Mathematics II, Physics I or Mechanics I, and five other subjects at any level, except English II and Economics, provided the student has standing in the prerequisite subjects.

- Note: 1. Both Physics I and Mechanics I may be taken as two of the required nine subjects.
2. Any Grade I certificate is accepted as the educational requirement for certification as an Engineering Technician by the Association of Professional Engineers of the Province of Ontario.
 3. Any student who completes the nine subjects listed below with an overall average of 60 per cent and not less than 50 per cent in any subject may be admitted directly to the second year of an engineering technology course in an Ontario Institute of Technology.
 4. The first nine subjects in the list below are considered as those normally taken for the Grade I certificate, but substitutions for any of the five optional subjects may be made from those listed for

} Grade II and III certificates provided the student has standing in the prerequisite subjects.

SUBJECTS	PREREQUISITE
1. English I	
2. Mathematics I	
3. Mathematics II	Mathematics I
4. Physics I	Mathematics I
5. Mechanics I	Mathematics I
6. General Chemistry	
7. Electrical Fundamentals	Mathematics I
8. Electronic Fundamentals	Electrical Fundamentals and Mathematics II
9. Technical Drawing	

Additional subjects that may be substituted for one or more of the optional subjects above to complete the requirements for a Grade I certificate.

Instrumentation I	Physics I
Instrumentation II	Instrumentation I and Electronics I
Foundry Technology I	General Chemistry*
Foundry Technology II	Foundry Technology I

A prerequisite subject must be completed before commencing the subject for which it is a prerequisite, except for those technical subjects for which Mathematics I, II, III or IV are prerequisites. In these cases the Mathematics subjects may be taken concurrently with the technical subjects.

* Preferable but not compulsory.

Grade II and Grade III Certificate Courses

(Six Subjects Each)

REQUIREMENTS FOR ADMISSION

Students may be enrolled in subjects at the Grade II and Grade III certificate levels prior to completion of the requirements for the Grade I certificate, provided they have credits in the prerequisite subjects.

REQUIREMENTS FOR CERTIFICATES

A Grade II certificate will be awarded to a student who completes successfully Mathematics III and English II, and any four of the remaining subjects, Economics excepted, selected from any program shown ~~below~~ *on the following*.

Any Grade II certificate is accepted as the educational qualification for certification as a Senior Engineering Technician by the Association of Professional Engineers of the Province of Ontario.

A Grade III certificate will be awarded to a student who completes successfully six additional subjects selected from the list ~~below~~ *on the following*.

A Grade III certificate in one of the programs listed below is accepted as the educational requirement for certification as an Engineering Technologist by the Association of Professional Engineers of the Province of Ontario, provided the candidate's technical report is acceptable to the Certification Board of the Association, and provided that the applicant has standing in General Chemistry, Physics I, Mathematics IV and Economics*. Applicants for certification as Engineering Technologists should clear any deviations from the proposed programs with the Certification Board of the Association of Professional Engineers prior to commencing the course leading to the Grade III certificate.

NOTE: Students who propose to use the technical report written for English II as the report for certification should submit the topic and a one-page synopsis to the Certification Board for approval. After the report has been assessed by the instructor in English II, it should be retained by the student for submission to the Certification Board at the time he

* Economics is optional in Chemical Technology.

makes his application to be certified as an Engineering Technologist. It is suggested that the Instructor in English II submit the topics and synopses, in one mailing, for all members of the class to the Special Services Officer, the Association of Professional Engineers of the Province of Ontario, 236 Avenue Road, Toronto.

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Programs for Grade II and III Certificates

SUBJECTS	PREREQUISITES
SUBJECTS COMMON TO ALL PROGRAMS	
English II (Report)	English I
Mathematics III	Mathematics II
Mathematics IV	Mathematics III
Economics	
ELECTRICAL TECHNOLOGY	
Electrical Equipment	Electrical Fundamentals
A.C. Circuits	Electrical Fundamentals and Mathematics III
Modern Physics	Physics I and Mathematics III
Electrical Measurements	Electrical Fundamentals
Electrical Control Systems I	A.C. Circuits and Electrical Measurements
Electrical Control Systems II	Electrical Control Systems I and Mathematics IV
Power Systems	A.C. Circuits
Industrial Electronics	Electronic Fundamentals
Electrical Machine Design	Electrical Equipment
ELECTRONIC TECHNOLOGY	
A.C. Circuits	Electrical Fundamentals and Mathematics III
Electronic Circuits	A.C. Circuits and Electronic Fundamentals
Modern Physics	Physics I and Mathematics III
Pulse Circuits	Electronic Circuits and Mathematics IV
Electronic Systems I	Pulse Circuits
Electronic Systems II	Electronic Systems I
Communications	Electronic Circuits and Mathematics IV
Electronic Control Systems	Pulse Circuits
Communication Systems	Electronic Circuits and Mathematics IV

SUBJECTS	PREREQUISITES
MECHANICAL TECHNOLOGY	
Mechanics of Materials I	Mechanics I and Mathematics II
Mechanics of Materials II	Mechanics of Materials I and Mathematics III
Mechanics II	Mechanics I and Mathematics III
Metallurgy	General Chemistry
Machine Design	Mechanics of Materials I, Mechanics II, and Technical Drawing
Mechanics of Fluids	Mechanics II
Tool Design	Mechanics of Materials I and Technical Drawing
Theory of Machines	Mechanics II
Work Shop Technology	Technical Drawing*
Thermodynamics	Physics I and Mathematics III
CIVIL TECHNOLOGY	
Mechanics II	Mechanics I and Mathematics III
Mechanics of Fluids	Mechanics II
Mechanics of Materials I	Mathematics II and Mechanics I
Mechanics of Materials II	Mechanics of Materials I and Mathematics III
Soil Mechanics and Foundations	Mechanics of Materials II
Construction Materials	Soil Mechanics and Foundations
Theory of Structures	Mathematics IV and Mechanics of Materials II
Structural Design in Reinforced Concrete	Mathematics IV and Mechanics of Materials II
Structural Design in Timber and Steel	Mathematics IV and Mechanics of Materials II
Engineering Problems and Drawing	Theory of Structures, Structural Design in Reinforced Concrete, Timber and Steel
Sanitary Engineering	Mechanics of Fluids
Surveying	Mathematics I
Highway Technology	Surveying and Mathematics II
INDUSTRIAL TECHNOLOGY WITH AN OPTION IN MANAGEMENT TECHNOLOGY	
Statistics I	Mathematics II
Statistics II	Statistics I

* Preferable but not compulsory.

SUBJECTS

PREREQUISITES

Time and Motion Study

Mathematics I*

Industrial Organization

Production Control

Mathematics I*

Mechanics of Materials I

Mathematics II and Mechanics I

Jigs and Fixtures

Mechanics of Materials I and
Technical Drawing

Operations Research

Industrial Electronics

Electronic Fundamentals

Plant Layout and Materials

Handling

Technical Drawing*

Machine Design

Mechanics of Materials I, Mechanics II,
and Technical Drawing

Electrical Systems

Electrical Fundamentals

MANAGEMENT TECHNOLOGY (OPTION OF INDUSTRIAL TECHNOLOGY)

One or more of the following subjects may be substituted in place of a like number of subjects of the Industrial Technology course. (These five subjects have not been approved as yet by the Association of Professional Engineers for certification as Engineering Technicians and Technologists.)

Value Economics

Labour Relations

Systems and Procedures

Wage and Salary Administration

Data Processing

Mathematics I*

CHEMICAL TECHNOLOGY

The Committee on Certification of Chemical Technicians sponsored by the Chemical Institute of Canada has accepted the Advanced Technical Evening Class program in Chemical Technology as meeting the academic requirements for certifying Chemical Technicians and Technologists. The certification is as follows:

Grade I ATEC certificate—Assistant Chemical Technician

Grade II ATEC certificate—Chemical Technician

Grade III ATEC certificate—Chemical Technologist

Inorganic Chemistry

General Chemistry

Physical Chemistry I

General Chemistry and Mathematics I

Organic Chemistry I

General Chemistry

Chemical Physics

Physics I and Mathematics III

* Preferable but not compulsory.

SUBJECTS

PREREQUISITES

Organic Chemistry Laboratory	Organic Chemistry I
Physical Chemistry II	Physical Chemistry I and Mathematics IV
Physical and Instrumental Methods Laboratory	Physical Chemistry I, Electrical Fundamentals, and Mathematics IV
Quantitative Inorganic Analysis Laboratory	Inorganic Chemistry, Physical Chemistry I, Organic Chemistry I, and Mathematics III
Chemical Engineering Principles	Inorganic Chemistry and Physical Chemistry II
Industrial Chemical Processes	Inorganic Chemistry, Organic Chemistry I, and Physical Chemistry II
Organic Chemistry II	Organic Chemistry Laboratory, Inorganic Chemistry, and Mathematics III

Additional subjects and courses may be approved by the Department of Education as the need arises.

CREDITS

Credits in certain subjects of the Grade I certificate may be allowed on presentation of proof of standing in the Grades 11, 12 or 13 subjects shown in the following list:

English I: Grade 13 English Composition and English Literature

Mathematics I: Grade 13 Algebra, Trigonometry and Statics

Mathematics II: Grade 13 Algebra, Trigonometry and Statics and Geometry

Physics I: Grade 13 Physics, or, Grades 11 and 12 Industrial Physics as the technical subject

General Chemistry: Grade 13 Chemistry, or Grades 11 and 12 Industrial Chemistry as the technical subject

Electrical Fundamentals: Grades 11 and 12 Electricity as the technical subject

Electronic Fundamentals: Grades 11 and 12 Electronics as the technical subject

Technical Drawing: Grades 11 and 12 Mechanical Drafting as the technical subject

Workshop Technology: Grades 11 and 12 Machine Shop as the technical subject.

Standing in subjects of the United Kingdom Ordinary National and Higher National Certificates, and in subjects of the Provincial Institutes of Technology and Ontario Vocational Centres' day courses may be assessed by the principal as credits for subjects of the Advanced Technical Evening Class courses.

A maximum of six credits only may be allowed toward the Grade I certificate, and four for each of the Grade II and Grade III certificates. An applicant for credit must supply adequate proof that he has completed satisfactorily a study of the subject or subjects for which he expects credit.

Forms on which to make application for credit may be obtained from the Director of the Technological and Trades Training Branch.

In special cases such as those listed below, where assessments are difficult, the principal

1. may require the applicant to write a qualifying examination,

or,

2. may permit the applicant to take another subject for which the subject under assessment is a prerequisite. If the student is successful in the advanced subject, he will be granted credits in both the advanced subject and its prerequisite. If there is doubt concerning a credit in Mathematics I, for example, a pass in Mathematics II would establish credits in both Mathematics I and II.

Examples of Special Cases:

Students who have attended other evening courses of at least 50 hours' duration;

Students who have completed correspondence courses of at least 100 hours' duration;

Students who are over 25 years of age and have had at least three years' industrial experience related to the subject in which credit is desired.

STANDARDS

The instructional time for each subject must be at least 50 hours exclusive of final examinations.

Regular tests and examinations are a part of the course in each subject. The passing grade in each subject is 50 per cent.

In order to ensure a general high standard, copies of the final examination question papers must be approved by the Department of Education before they are given.

During the term, regular inspections of the teaching of the Advanced Technical Evening Class subjects are carried out by an inspector from the Technological and Trades Training Branch of the Department of Education. Textbooks other than those listed on course outlines are subject to the approval of the Department.

With the approval of the principal, any book listed as a reference text in the course outline may be used as the text book in the subject.

PREREQUISITES

It is the responsibility of the principal to ascertain that a student has completed the necessary prerequisites before admitting him to classes in any subject of the course.

ASSIGNMENTS

During the instructional periods, the instructor should plan to use one-third to one-half of the time assisting with individual and class problems which arise. The instructor should also assign homework. The length of time to be spent on this assignment should be approximately equal to that spent in the classroom. These assignments should be corrected and the marks recorded by the instructor.

ADMINISTRATION

1. A school board desiring to establish and operate these classes should apply to the Minister of Education for permission. When permission has been granted, all further correspondence with reference to Advanced Technical Evening Class programs, and all requests for necessary forms, reports, and certificates should be addressed to the DIRECTOR OF THE TECHNOLOGICAL AND TRADES TRAINING BRANCH, DEPARTMENT OF EDUCATION, 44 EGLINTON AVENUE WEST, TORONTO 12, ONTARIO.
2. A list of the teaching staff, with their qualifications and subjects to be taught, should be submitted for approval before the classes are commenced.
3. An enrolment form showing the number of students enrolled in each subject, the hours and evenings involved, and the teacher's name, should be forwarded as soon as enrolment has been completed.
4. Outlines of courses for the various subjects may be obtained upon application.
5. Final marks for each student who writes a final examination are to be reported on forms available upon application.
6. When a student has completed satisfactorily an approved course of study, the principal may apply for the appropriate certificate.
7. A certificate of standing (2½ inches by 4 inches) for any part of the course may be obtained for presentation by the principal each year to any student who completes satisfactorily one or more subjects.

GENERAL

1. Final examinations should be set by the instructor and should be forwarded by the principal for approval one month prior to the date of the examination.
2. All final answer papers should be retained by the principal for one year following the date of the examination.
3. The final examination must count at least 70 per cent, and class work, tests and homework may count up to 30 per cent of the final mark.
4. A permanent record of attendance must be kept and each student's attendance record must be satisfactory to the principal before he recommends the award of a certificate.

WHERE TO APPLY

Applications for further information should be addressed to the DIRECTOR OF THE TECHNOLOGICAL AND TRADES TRAINING BRANCH, DEPARTMENT OF EDUCATION, 44 EGLINTON AVENUE WEST, TORONTO 12, ONTARIO.

Historical Sketch of the Advanced Technical Evening Class Program

by A. M. Moon, P.Eng.,

Assistant Superintendent of Secondary Schools (Ret.)

At the conclusion of the Second World War, leaders in technical and vocational education in Ontario, together with their opposites in industry, agreed concerning the necessity for the development of a peace-time training program for selected workers in industry who could not afford the luxury of returning to full-time formal day school instruction.

Through a questionnaire prepared by a small committee and mailed by the Canadian Manufacturers' Association to all its members, the suspected need was readily verified and the Chief Director of Education, the late Dr. J. G. Althouse, accepted a detailed proposal for the development of the Advanced Technical Evening Class program. This program, introduced for the first time in the history of Ontario envisaged (1) application to all centres of industrial development, (2) technical instruction on a post-secondary level closely paralleling that given in Provincial Technical Institutes, (3) selection of highly competent instructors from industry who were involved currently in the various applications of the subjects of the programs, and (4) the issuance of a Provincial Certificate covering an evening school program, with the signature of the Minister of Education.

The three-year program was first detailed with the assistance of the Research Council of the Technical Section, Ontario Education Association, and the Ontario Industrial Education Council. While the challenge to establish the first operating unit was accepted by the St. Catharines Collegiate and Vocational School in 1952 with an initial enrolment of 72 students, others soon to follow included Peterborough, Belleville, Brockville, Guelph and Galt. In 1954, the Minister of Education, through a province-wide memorandum to school boards, announced the provisions for the establishment of the ATEC program.

The degree of acceptance of the ATEC program can be judged by the fact that no sooner had students graduated from the first level of the course when they requested an extension of the program. Accordingly, a second level was developed leading to a Grade II certificate. Industry too played its part in recognizing employee's efforts by granting promotions, and salary and wage increases.

